Standard:

8th Grade 8.E.2.1 Students are able to compare celestial bodies within the solar system using composition, size and orbital motion.

Purpose:

Students will identify constellations.

Materials needed:

- Index cards with a constellation listed on them

Instructions:

1. Divide students into groups.
2. Give each group an index card.
3. The students in the group must decide how they will arrange themselves to represent the constellation. (Limit each group to a section of the room or gym.)
4. Groups of students take turns identifying constellations.
5. When all groups are ready, teacher says, “Go!”
6. Students scramble to spots, and then silently hop up and down to represent giving off light.

Adaptations:

- Class size will determine size of groups. If the class is very small, the teacher may want to have one student guess what constellation the other students have created.

References:

- None

Standard:

6th Grade 6.S.2.1 Students are able, given a scenario, to identify the problem(s) of human activity on the local, regional, or global environment.

7th Grade 7.S.2.1 Students are able, given a scenario, to identify the consequence(s) of human activity on the local, regional, or global environment.

Purpose:

Students will match scenarios with problems, consequences and solutions.

Materials needed:

- Construction Paper with causes and consequences
- Markers
- Tape

Instructions:

1. Teacher will have consequences written on pieces of construction paper and taped to a wall on one side of the room.
2. On the wall opposite wall will be causes that will be matched up with consequences.
3. Teacher partners students up and have them sit on the floor in the middle of the room.
4. Partners decide who will go to the "consequence" wall and the "causes" wall.
5. Upon teacher's command the students move to their respective walls and grab a piece of paper.
    a. Skip to the "consequence" wall
    b. Gallop to the "causes" wall
6. Students now move in the same manner back to the middle of the room and talk with partner to determine if they have a match.
7. If the partners are satisfied that their cause and consequences match, they tape it to the wall in the front of the room.
8. If the partners are not satisfied, they must talk with other groups, return to the wall and pick another sheet of paper.

Adaptations:

- None

References:

- None

Standard:

8th Grade 8.E.1.4 Students are able to examine the chemical and physical properties of the ocean to determine causes and effects of currents and waves.

Purpose:

Students will identify what is a cause and what is an effect.

Materials needed:

- A list of causes and effects of the chemical and physical properties of oceans.

Instructions:

1. Students stand next to their desks.
2. Teacher will state a cause or effect.
3. If it is a cause, students will clap.
4. If it is an effect, students will march in place.

Adaptations:

- The type of movement can be varied.

References:

- None

Standard:

6th Grade 6.L.1.1 Students are able to illustrate the difference between plant and animal cells.

7th Grade 7.L.1.1 Students are able to identify basic cell organelles and their functions.

Purpose:

Students will understand the fundamental structures, functions, classifications, and mechanisms found in living things.

Materials needed:

- Separate sets of index cards with names of animal and plant cell parts/ organelles for each group
- Separate sets of index cards with organelle functions of plant and animal cells for each group
- Several outlines of plant cell and animal cell on bulletin board

Instructions:

1. Divide the students into groups.
2. Give each group a set of name cards (some groups may have animal cells and some will have plant cells)
3. On "go" the students will label the correct cell with the cards.
4. Do again but exchange cards.
5. Do again using the organelle functions cards.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.L.2.1 Analyze various patterns and products of natural and induced biological change.

7th Grade 7.L.2.1 Students are able to conduct scientific investigations using given procedures.

Purpose:

Analyze various patterns and products of natural and induced biological change using multiple traits.

Materials needed:

- Cards representing various alleles. Examples: Eyes – B brown, b blue, Fur – F black, f white, Toes – T three, t two, Antennae – A four, a two, Arms – D four, d two, Legs – L four, l two, Ears– E six, e three

Instructions:

1. Hand each student a card.
2. Students are to pair alleles to make a purebred or hybrid gene.
3. When teacher says "purebred dominant" all pairs that are such must beat their chests and do their best Tarzan impression.
4. When teacher says "purebred recessive" all pairs that are such must hunch over and silently walk around the room like they are using a cane.
5. When teacher says "hybrid" all pairs that are such must hop on both feet.
6. Pairs find other pairs to "create" a complete creature that includes eye, fur, toes, antennae, arms, legs and ears.
7. When teacher says "creatures cross eye color" one eye color allele from each creature must go to a different creature.
8. All members of the new creature must do the movement from 3, 4, or 5 according to the new pair of eye color alleles.
9. Teacher chooses a different trait and repeats the above.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.E.1.3 Students are able to explain processes involved in the formation of Earth's structure.

8th Grade 8.E.1.1 Students are able to identify and classify minerals and rocks.

Purpose:

Analyze various structures and processes of the Earth system.

Materials needed:

- Several strips of paper and tape for each student

Instructions:

1. Tell students that when you say, "Go," they are to form loops with their paper and then attach them to other students' loops, to form chains.
2. Give students a short amount of time for this.
3. Students are to continue until you say, "Stop."
4. Give the students more time on the next try.
5. Discuss that smaller chains were formed when students were given less time, but larger chains were formed when students were given more time.
6. This represents how crystals are formed in igneous rock with larger crystals formed during long, slow periods of cooling.

Adaptations:

- None

References:

- Glencoe Science Level Red, 2005 Edition, pg. 267.

Standard:

6th Grade 6.P.3.1 Students are able to identify types of energy transformations.

6th Grade 6.E.1.2 Students are able to examine the role of water on the Earth.

Purpose:

Students analyze interactions of energy and matter and various structures and processes of the Earth system.

Materials needed:

- Several volleyballs or soccer balls

Instructions:

1. Students form a line.
2. The first person in line passes a ball to the second person. (teacher determined)
3. Continue passing the ball down the line.
4. The first person may add another ball after the second person passes the ball.
5. After all the balls have been passed discuss with the students that the ball moves but the people in line do not change position. The people are like molecules of water on which the waves pass through. Waves can transport energy without transporting matter.

Adaptations:

- None

References:

- Glencoe Science, Level Red, 2005 edition, pg. 227.

Standard:

6th Grade 6.P.1.3 Students are able to describe phase changes in matter differentiating between the particle motion in solids, liquids and gases.

8th Grade 8.P.1.3 Students are able to compare properties of matter resulting from physical and chemical changes.

Purpose:

Students describe structures and properties of, and changes in, matter.

Materials needed:

- None

Instructions:

1. Line students up shoulder to shoulder.
2. Instruct them to slowly step from one foot to the next to represent the motion of particles in a solid.
3. Next instruct the students to take one step to their right, turn to their left and place their hands on the shoulders of the person in front of them.
4. The students should start walking forward as the leader "snakes" them around the room to represent the fluid motion of liquids.
5. Next instruct the students to go back to their seats to represent the motion of gases in all directions.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.P.1.2 Classify matter based on physical and chemical properties.

6th Grade 6.P.1.3 Describe phase changes in matter differentiating between the particle motion in solids, liquids, and gases.

Purpose:

Students will represent the molecules in solid, liquid, and gaseous states. They will demonstrate the speed of sound in each state of matter.

Materials needed:

- None

Instructions:

1. Divide the class into groups (unless it is a small class, then complete as whole-group activity).
2. One group represents the solid state by standing one foot apart.
3. One group represents the liquid by standing 4-6 feet apart.
4. The last group represents a gas by standing 8-10 feet apart.
5. Demonstrate movement in the states of matter by bumping back and forth and from side to side.
6. Demonstrate a sound wave by a tap on the shoulder.
7. Discuss the state of matter in which sound travels the fastest and slowest and why?

Adaptations:

- None

References:

http://mindsinmotion.org/lessonplans.html

Standard:

6th Grade 6.P.2.1 Students are able to describe how push/pull forces acting on an object produce motion.

8th Grade 8.N.1.1 Students are able to differentiate among facts, predictions, theory, and law/principles in scientific investigations.

Purpose:

Analyze forces, their forms, and their effects on motions using Newton's Laws.

Justify facts, predictions, theory, and law/principles in scientific investigation using Newton's Laws.

Materials needed:

- Have an assortment of examples of each law

Instructions:

1. Push a book across the lab table. Students hop as high as they can if the motion represents Newton's 1st Law, clap hands above head once if the motion represents Newton's 2nd Law, or touch elbow to knee if the motion represents Newton's 3rd Law. (1st law)
2. Push an empty chair. Have a student sit in the chair and push it again. Students will perform movement associated with the appropriate Newton's Law. (2nd law)
3. Instruct the students to do a standing broad jump. Students will perform movement associated with the appropriate Newton's Law. (3rd law).

Adaptations:

- None

References:

- None

Standard:

7th Grade 7.L.1.2 Students are able to identify and explain the function of the human systems and the organs within each system.

Purpose:

Students will show understanding of which body organs go with which human system.

Materials needed:

- List of body organs and movement for each

Instructions:

1. Teacher will instruct students to stand next to their desks.
2. Teacher will instruct the class as to the appropriate movements for each organ system.
    a. Skeletal/support – Knock on your noggin' (lightly please, there's good stuff in there).
    b. Muscular – March in place.
    c. Digestive – Rub your belly.
    d. Respiratory – Fill lungs with 3 deep breaths.
    e. Circulatory – Feel heartbeat, touch toes, check pulse.
    f. Reproductive – Twist dance.
    g. Endocrine – Put hands on waist and make a circle with shoulders.
    h. Immune – Pretend sneeze; cover mouth.
    i. Nervous – Alternately hunch down at the spine, then stretch it out.
    j. Excretory – Fan self as if perspiring.
    k. Integumentary – Rub the skin on your arms.
3. Movements are to be continued until a new organ announced.
4. Teacher will announce organs one by one making sure the students are moving in the appropriate manner.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.L.3.1 Analyze how organisms are linked to one another and the environment.

6th Grade 6.P.3.1 Students are able to identify types of energy transformations.

7th Grade 7.L.3.1 Students are able to predict the effects of biotic and abiotic factors on a species' survival.

Purpose:

Students will model the process of photosynthesis.

Materials needed:

- None

Instructions:

1. Divide the students into groups.
2. Give the students 5 minute to demonstrate the process of photosynthesis in a skit.
3. Students perform skits for the class.

Adaptations:

- None

References:

- None

Standard:

6th Grade	6.P.1.1	Students are able to identify the subatomic particles that make up atoms.
7th Grade	6.P.1.2	Students are able to classify matter based on physical and chemical properties.
8th Grade	8.P.1.2	Students are able to use the Periodic Table to compare and contrast families of elements and to classify elements as metals, metalloids, or non-metals.

Purpose:

To familiarize the students with the location of protons, electrons and neutrons in an atom.

Materials needed:

- Index cards labeled with an element and/or symbol
- Index cards labeled and color coded: electron (black), proton (blue), or neutron (red) (Must have enough of each to make the elements)
- Make a circle to represent the nucleus in the middle of the room. (Use yarn, string, etc.)

Instructions:

1. Teacher gives each student 3 cards: a proton, electron, and neutron card.
2. After talking about the meaning of the atomic number, the teacher will hold up an element card at the front of the class.
3. Class will determine how many of the protons and neutrons need to go in the middle circle and how many electrons need to walk around the nucleus. Students will then pick out the correct cards and move to the appropriate location.
4. 8th graders should break the electrons down into the appropriate energy levels and orbit the nucleus appropriately. They should also be able to identify it the element is a metal, metalloid, or non-metal.

Adaptations:

- None

References:

- None

Standard:

8th Grade 8.P.1.1 Students are able to clarify matter as elements, compounds, or mixtures.

Purpose:

Students will identify whether a compound is an ionic or a covalent bond.

Materials needed:

- Cards with names of compounds on them and whether they are ionic or covalent bonds
- Labels on the wall, one saying ionic, the other covalent

Instructions:

1. Students are paired up and given a card with the name of a compound on it.
2. Pairs are placed on either side of the room.
3. Teacher then indicates who will call a person to come over from the other side of the room.
4. Each pair will lock arms or just stand closely without touching each other to indicate type of bond.
5. From observing whether or not the pair is broken apart or not, the class determines whether the compound is an ionic bond or a covalent bond.
6. The pair is then sent to one side of the room or the other as labeled on the wall.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.E.1.3 Students are able to explain processes involved in the formation of the Earth's structure.

8th Grade 8.E.1.1 Students are able to identify rocks as sedimentary, igneous, or metamorphic.

Purpose:

Categorize rocks as sedimentary, igneous, and metamorphic.

Materials needed:

- Tables set up in a circle around the room
- Five of them with cards on them labeled magma; igneous rock; sediment; sedimentary; metamorphic
- Four tables (one between each rock table) with different process of the rock cycle on them

Instructions:

1. Teacher will give each student a card with a specific type of rock on it.
2. Students will then go to a process table and pick up a card.
3. Student will determine what type of card they need to pickup next from looking at the process.
    a. (i.e. starts with a magma card; picks up cooling process card; go to igneous rock table and pick up card)
4. Student will gallop forward if the process card takes the student to the next step in the rock cycle (i.e. magma to igneous rock).
5. Student will skip backwards if the process takes them back in the process of the rock cycle (i.e. sedimentary rock to sediment).
6. Students continue the process of picking up rock types and process cards until they have all five cards.
7. Student will place the cards in the proper order of the rock cycle starting with magma and ending with metamorphic rock.

Adaptations:

- May use desks or sections taped off on the floor instead of tables

References:

- None

Standard:

6th 6.N.2.1 Students are able to pose questions that can be explored through scientific investigations.

7th 7.N.2.1 Students are able to conduct scientific investigations using given procedures.

8th 8.N.2.1 Students are able to design a replicable scientific investigation.

Purpose:

Students will demonstrate proper safety procedures in all investigations.

Materials needed:

- Various science tools (beakers, goggles, aprons, etc.)
- List of science classroom safety procedures

Instructions:

1. Divide students into groups of 3 to 4.
2. Assign each group a different safety procedure.
3. With 5 minutes or less students must create a skit showing the incorrect and correct way to conduct a procedure using lab equipment.
4. Groups perform skits for the class.

Adaptations:

- None

References:

- None

Standard:

8th Grade 8.P.1.3 Compare properties of matter resulting from physical and chemical change.

Purpose:

Students will create and decode secret messages using acids and bases.

Materials needed:

- 1 c. water + vinegar or 1 c. water + ammonia
- Pitcher of cabbage water
- Chart paper
- Cotton swabs
- Spray bottle

Instructions:

1. Write a secret message or word on chart paper using a cotton swab and solution.
2. For movement, after writing secret message, students will perform 10 jumping jacks while message dries completely.
3. Have a student come to the front of the room and spray the message with the cabbage water.
4. Allow students to write messages and reveal them.
5. Discuss what is happening.

Adaptations:

- None

References:

- http://www.miamisci.org/ph/lpexcite3.html

Standard:

6th Grade 6.E.2.1 Students are able to identify the organization and relative scale of the solar system.

8th Grade 8.E.2.1 Students are able to compare celestial bodies within the solar system using composition, size, and orbital motion.

Purpose:

Analyze essential principles and ideas about the composition and structure of the universe.

Materials needed:

- Flash cards with facts about the three types of galaxies

Instructions:

1. Teacher will read a fact from a flash card.
2. When the fact describes an elliptical galaxy the students will pretend to lasso in an elliptical pattern.
3. When the fact describes a spiral galaxy the students will stand and spin.
4. When the fact describes an irregular galaxy the students wiggle like a worm.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.E.2.1 Students are able to identify the organization and relative scale of the solar system.

8th Grade 8.E.2.2 Students are able to differentiate the influences of the relative positions of the earth, moon, and sun.

Purpose:

Students are able to identify the phases of the moon and the moon's relative position.

Students are able to describe how the far side of the moon never faces the Earth.

Materials needed:

- Model of the sun hung in the center of a wall
- Globe

Instructions:

1. Arrange the students in a large circle.
2. Set the globe (Earth) in the center of the circle.
3. Each student is a moon.
4. The "moons" face the Earth.
5. When teacher says "gibbous" all students in the gibbous phase will do jumping jacks.
6. When teacher says "crescent" all students in the crescent phase will run in place.
7. When teacher says "waning" all students in waning position will clap.
8. When teacher says "waxing" all students in waxing position will hop on one foot.
9. When teacher says "full moon/new moon" the students in those positions will touch their toes.
10. Instruct students to move five steps to the right so the moon position changes and repeat the above procedures.

Adaptations:

- None

References:

- None

Tongue Twisters
The pH factor

Standard:

7th Grade 7.L.1.2 Identify and explain the function of the human systems and the organs within each system.

Purpose:

Students will taste sour and bitter substances and map areas of the tongue which can taste the substances.

Materials needed:

- 1 c. water + 1 c. vinegar, 1 c. water + lemon, 1 c. water + unsweetened cocoa, 1 c. water + baking soda
- Cotton swabs, masking tape, markers, chalk, blindfold, cups
- Large diagram of a tongue, smaller copies for students

Instructions:

1. Teacher mixes tasting solutions. Label the cups with B, V, L, and C to represent the solutions. Place the solutions at different stations.
2. Place large diagram of the tongue at front of class.
3. WARN students they should never taste unknown solutions and assure them that all solutions used in the activity are safe.
4. Divide students into pairs or groups. Distribute a copy of tongue to each student.
5. Tell students to hold their noses. At each station, dip the swab into the solution and lightly touch it to various areas of the tongue. Use a new swab for each solution.
6. Write the letter of the solution cup on their tongue diagrams to show where they tasted the solution the most, such as B (for baking soda).
7. Have students hang tongue diagrams in front of room.
8. Discuss any patterns that are apparent.
9. Use the large diagram to represent the patterns.

Adaptations:

- "Draw" a tongue on the floor with tape and have students represent a solution by doing an activity in the area of the tongue where they tasted a solution.

References:

- http://www.miamisci.org/ph/lpexcite1.html

Standard:

6th Grade	6.S.1.1	Students are able to describe how science and technologies have helped society to solve problems.
7th Grade	7.S.1.1	Students are able to describe how science and technology are used to solve problems in different professions and businesses.
8th Grade	8.S.1.1	Students are able to describe how science and technology have been influenced by social needs, attitudes and values.

Purpose:

Students will determine whether or not statements about technological advances are true or false.

Materials needed:

- Bucket with folded paper that have movements on them
- Cards with statements about technological advances

Instructions:

1. Teacher reads statement off of one of the cards.
2. Students who believe the statement is true skip to the right side of the room; students who believe the statement is false duck walk to the left side of the room.
3. Teacher reveals the answer.
4. Group that is correct draws a consequential movement out of the bucket and the group who was wrong does the movement.

Adaptations:

- None

References:

- None

Standard:
7th Grade 7.L.1.4 Students are able to describe and identify the structure of non-vascular plants.

Purpose:
Understand the fundamental structures and functions of plants.

Materials needed:
- List of plant parts

Instructions:
1. The teacher will say the part of a plant.
2. Students will grasp hands, forming a line, and "flow" around the room if the part belongs to a vascular plant.
3. Students will swirl their bodies around in place if the part belongs to a non-vascular plant.

Adaptations:
- None

References:
- None

Standard:

8th Grade 8.E.1.3 Students are able to explain the factors that create weather and the instruments and technologies that assess it.

Purpose:

To show knowledge of factual information about weather causes and technologies used to study and predict weather.

Materials needed:

- Directions written on board or where all students are able to see
- List of factors

Instructions:

1. Students stand in a circle.
2. Teacher will instruct the students on how they will move:
    - March in place for a meteorological agency.
    - Walk forward for a frontal system.
    - Walk backwards for a pressure system.
    - Hop on right foot for factor (Ex. Coriolis Effect)
3. Teacher names a factor.
4. Students start moving in the appropriate manner.
5. Teacher names second factor.
6. Students immediately start moving in the next manner.

Adaptations:

- None

References:

- None

Standard:

6th Grade	6.P.1.2	Students are able to classify matter based on physical and chemical properties.
8th Grade	8.P.1.1	Students are able to classify matter as elements, compounds, or mixtures.
8th Grade	8.P.1.2	Students are able to use the Periodic Table to compare and contrast families of elements and to classify elements as metals, metalloids, or non-metals.

Purpose:

Students will be able to classify substances as an element, compound, or mixture by looking at properties of that substance.
Students will categorize elements as metals/non-metals.

Materials needed:

- Index cards with the names of substances written on them
- Category headings on the wall (See standards.)
- Tape for each team

Instructions:

1. Place category headings on a classroom wall where they can be clearly seen by all the students.
2. Split class into four teams, lining them up in relay form.
3. Give each team a roll of tape and the same number of index cards. Place the cards upside down at the front of the team.
4. Upon teacher's direction the first student will take the top card in the pile and determine under which category heading it falls.
5. That student should take the card and tape it under the appropriate heading and return to the team, slapping hands with the next person in line and moving to the back of the line.
6. The second person then takes the second card and repeats the process.
7. Team continues to classify substances until finished.
8. After all substances have been classified determine which are classified correctly. Make necessary changes.

Adaptations:

- Have 8th grade students classify elements as a metal/non-metal/metalloid.

References:

- None

Standard:

6th Grade 6.E.1.2 Students are able to examine the role of water on the Earth

6th Grade 6.E.1.3 Students are able to explain processes involved in the formation of the Earth's structure.

6th Grade 8.E.1.5 Students are able to explain the impact of weather and erosion on the Earth.

Purpose:

Students will better understand the natural weathering forces that affect the surfaces of the earth.

Materials needed:

- Cards identifying whether the student is wind, water, or a part of the rock

Instructions:

1. All students who are a part of the rock will huddle in a small group in the middle of the room.
2. Wind and water people should stand around the rock on the perimeter of the room and wait for the teacher to point at them.
3. When the teacher points at a water person, that person moves toward the rock and squeezes between two of the people in the group, pushing them apart, then going back to his/her original position, explaining the process.
4. When the teacher points at a wind person, that person runs by the rock and grabs a member of the rock, taking that piece of "rock" along while running to the other side of the room, explaining the process as the action is performed.

Adaptations:

- Teacher can dictate that only members of the rock that have been pushed apart by the water can be taken from the group.
- Teacher can dictate that a member of the rock can only be taken after they have been touched twice (dictated number of times determined by the teacher) by a wind person – wind people will know as the rock people will hold their hands up if they have been touched once.
- All wind students could "erode" at the same time.
- All water students could "erode" together.

References:

- None